What choice(s) do we have? Processing and contextual constraints on syntactic variation across the globe

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Introduction

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- "Exploring probabilistic grammar(s) in varieties of English around the world" (5-year project, 2013–2018; PI: Benedikt Szmrecsanyi)
- synthesize disjoint lines of scholarship – research on World Englishes & Probabilistic Grammar – into one unifying project with a coherent empirical and theoretical focus
- main goal: understand the plasticity of probabilistic knowledge of grammar, on the part of language users with diverse regional and cultural backgrounds

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- main goal: understand the plasticity of probabilistic knowledge of grammar, on the part of language users with diverse regional and cultural backgrounds
- today: variation across three syntactic alternations in 9 international varieties of English

Today

1. Introduction
2. Method & Data
3. Findings
4. Concluding remarks

The "English World-Wide Paradigm"

- wide range of postcolonial varieties (e.g. Hong Kong E), inner circle varieties (e.g. British E), shift varieties (e.g. Irish E),...
- topics: scope, limits, parameters of variation; extent to which structural make-up of varieties of E can be predicted by communicative needs of colonizers/colonized
  (e.g. Kachru 1992; Schneider 2007; Mesthrie and Bhatt 2008)
- shortcoming: an often primarily descriptive interest in the variable presence/absence of features, or in usage frequencies of features

The Probabilistic Grammar framework

- rely on the variation-centered, usage- and experience-based probabilistic grammar framework developed by Joan Bresnan and collaborators

  (e.g. Bresnan et al. 2007; Bresnan and Ford 2010; Wolk et al. 2013)

  1. syntactic variation – and change – is **subtle, gradient & probabilistic** rather than categorical in nature

     (Labov 1982; Bresnan and Hay 2008)
  2. linguistic knowledge includes **knowledge of probabilities**, and speakers have powerful predictive capacities

     (Gahl and Garnsey 2004; Gahl and Yu 2006)

The Probabilistic Grammar framework

"A probabilistic, usage-based approach to grammar is able to account for [...] variation by assuming that different communities differ in the types and frequencies of the constructions that they are exposed to. However, **a probabilistic approach also predicts that variation across space and time should exist in less obvious ways** - even affecting the **subtle probabilistic choices** that are made between two variants which are equally acceptable for that dialect. [...], we expect to observe syntactic differences in time and space which are reflected [...] in extremely subtle factors such as the **relative probabilistic weights of conditioning factors** [...]."

Bresnan and Hay 2008: 246

Some research questions

- scope and limits of variation – do the varieties of English we study here share a core probabilistic grammar?
- dialect typology – does variety type (e.g. inner versus outer circle) predict probabilistic similarity between varieties of English?
- variation phenomena – do the alternations under study differ in terms of their probabilistic sensitivity to variety effects?

Method & Data

A methodological sketch of the project

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2. use the variationist method (Labov 1982) to create richly annotated corpus-derived datasets . . .
3. . . . to study the interplay of probabilistic factors constraining the alternations; check for significant differences between varieties
4. last stage of the project: conduct supplementary rating-task experiments

Varieties of English

- British E, Canadian E, Indian E, Singapore E, Irish E, New Zealand E, Hong Kong E, Jamaican E, Philippines E
- corpus database: 1.5m words of running text per variety, covering spoken/written English (ICE), and (eventually) web-based language (GloWbE)

genitive alternation

(1) a. [The Senator]$_{possessor}$'s [brother]$_{possessum}$
(the *s*-genitive)
b. [The brother]$_{possessum}$ of [the Senator]$_{possessor}$
(the *of*-genitive)

- variable context: identified *'s* and *of* occurrences; manually excluded e.g. partitive genitives and pronominal genitives; N=10,592
- investigator: Benedikt Heller

dative alternation

(2) a. We sent [the president]$_{recipient}$ [a letter]$_{theme}$
(the ditransitive dative)
b. We sent [a letter]$_{theme}$ to [the president]$_{recipient}$
(the prepositional dative)

- variable context: used a list of dative verbs to identify occurrences; manually excluded e.g. passivized verbs, elliptic structures, etc.; N=8,549
- investigator: Melanie Röthlisberger

particle placement

(3)
a. The president looked$_{verb}$ [the word]$_{NP}$ up$_{particle}$ (V-DO-P)
b. The president looked$_{verb}$ up$_{particle}$ [the word]$_{NP}$ (V-P-DO)

- variable context: transitive particle verbs involving one of the following 10 particles: *around*, *away*, *back*, *down*, *in*, *off*, *out*, *over*, *on*, *up*; manually excluded e.g. passive sentences and sentences with extracted direct objects; N=8,072
- investigator: Jason Grafmiller

Annotation

- predictors across alternations:
  constituent length (➪ end weight); animacy; constituent givenness; thematicity; TTR; overall frequency of head nouns; genre; variety
- alternation specific predictors:
  e.g. presence of directional PPs after particle verb constructions; final sibilancy of genitive possessors; definiteness (of direct object); NP expression type (common noun, pronoun, . . .), idiomaticity of verb-particle, . . .

regression analysis

- logistic regression probes the probabilistic conditioning of linguistic choice-making
- based on annotated linguistic observations, investigates the influence of (more than 1) constraint on a binary outcome (e.g. ditransitive vs prepositional dative)
- checks whether predictors have significant effect and estimates effect size and direction
- `glmer()`, `lrm()`, `glm()` functions in Rs `lme4` package

(Bates, Maechler, and Bolker Bates et al.; Harrell 2001)

Findings

Some first findings

- 3 alternations $\times$ nine varieties
- ICE data only; comparatively simple annotation; logistic regression modeling
- key findings:
  - varieties do share a core probabilistic grammar
  - indigenization at various degrees of subtlety, depending on abstractness of patterns
  - cf. Szmrecsanyi et al. 2016

Do the varieties of English we study share a core probabilistic grammar?

- yes, in the sense that there clearly are variety-independent, qualitative generalizations
- the **effect directions** of factors are stable across varieties of English – but interesting differences with regard to **effect size**

Probabilistic differences in the genitive alternation

Compared to GB...

- effect of animacy of possessor (HKE, NZE, PhiE)
- effect of final sibilancy of possessor (HKE, IndE)
- effect of possessum length (CanE, HKE, IrE, PhiE, SinE)

Probabilistic differences in the genitive alternation

(*the [Senator]'s brother* vs *the brother of the [Senator]*)

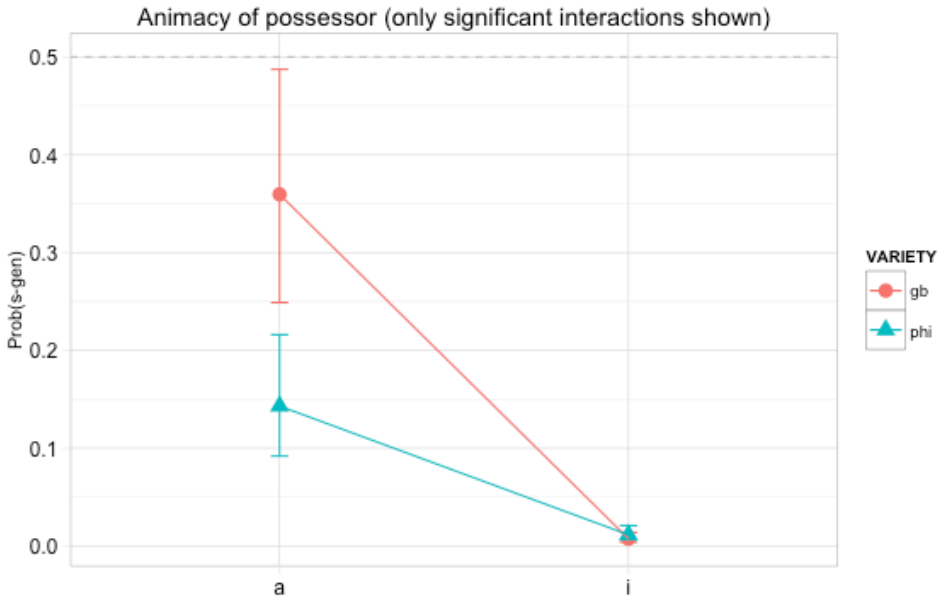

Figure: Predicted probability of the *s*-genitive obtained from mixed-effect model (with 95% confidence intervals)

Probabilistic differences in the dative alternation

Compared to all varieties...

- effect of length (IndE, JamE)
- effect of recipient pronominality (IndE, CanE, JamE)
- effect of register/style (NZE, IrE, JamE, HKE)
- effect of theme concreteness (CanE)

Probabilistic differences in the dative alternation

(*send [him] a letter* vs. *send a letter to [the Senator]*)

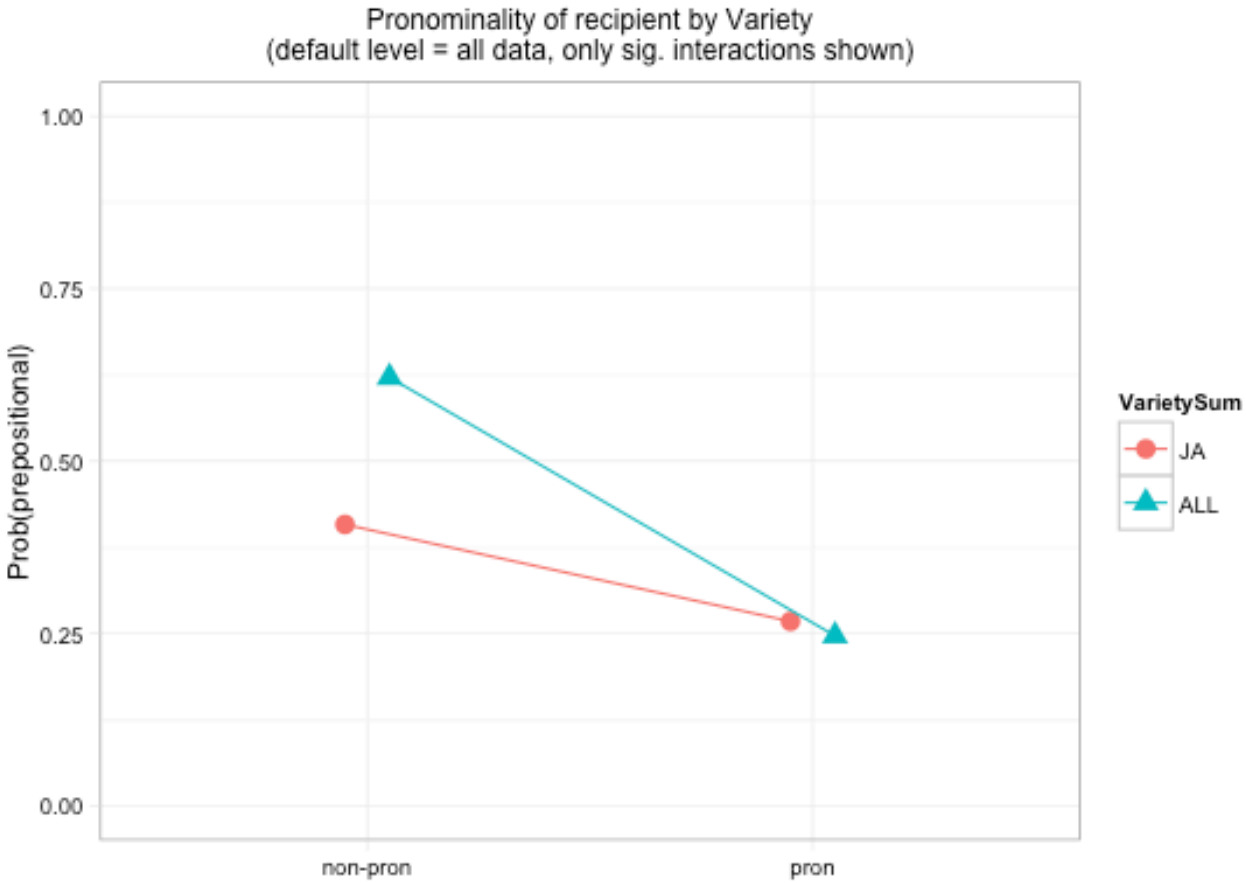

Figure: Predicted probability of the prepositional dative obtained from mixed-effect modeling

Probabilistic differences in particle placement

Compared to GB...

- effect of length (PhiE)
- effect of idiomaticity (NZE)
- effect of concreteness (PhiE, NZE)
- effect of givenness (SinE, IndE)
- effect of presence of post-modifying PP (IndE)

Probabilistic differences in particle placement

(*put [the book] back [on the table] vs put back [the book] [on the table]*)

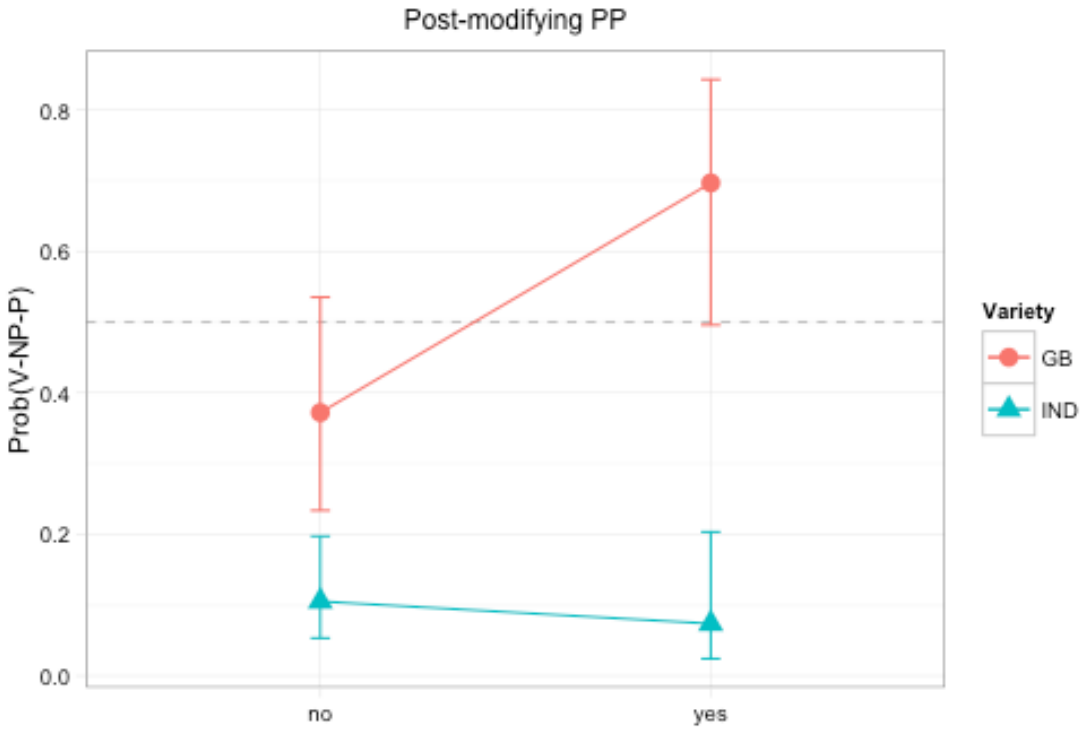

Figure: Predicted probabilities for the split order in Indian English obtained from the mixed-effect modeling (with 95% confidence intervals)

Do we find a split between inner and outer circle varieties of English?

- indications: IndE, SinE, NZE, HKE, PhilE, JamE
- inconclusive patterns

Do the alternations under study differ in terms of their probabilistic sensitivity to variety effects?

- amenability to "probabilistic indigenization":
  - most amenable: particle placement
  - less amenable: genitive alternation, dative alternation
- Schneider (2003: 249): lexico-grammar is a prime target of early-stage indigenization
- tentative generalization: the more tightly associated a given syntactic alternation is with concrete instantiations involving specific lexical items the more likely it is to exhibit cross-varietal indigenization effects

Concluding remarks

What's new

- crossroads of research on English as a World Language, usage-based theoretical linguistics, variationist linguistics and cognitive sociolinguistics

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- crossroads of research on English as a World Language, usage-based theoretical linguistics, variationist linguistics and cognitive sociolinguistics
- interest in scope and limits of variation in a large-scale comparative perspective
- assume that language users implicitly learn the probabilistic effects of constraints on variation by constantly (re-)assessing input of spoken and written discourses throughout their lifetimes

Team members

Benedikt Szmrecsanyi
Principle investigator

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particle placement

Benedikt Heller
MA, 2013, University of Giessen
the genitive alternation

Melanie Röthlisberger
MA, 2011, University of Zurich
the dative alternation

Thank you!

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http://wwwling.arts.kuleuven.be/qlvl/ProbGrammarEnglish.html

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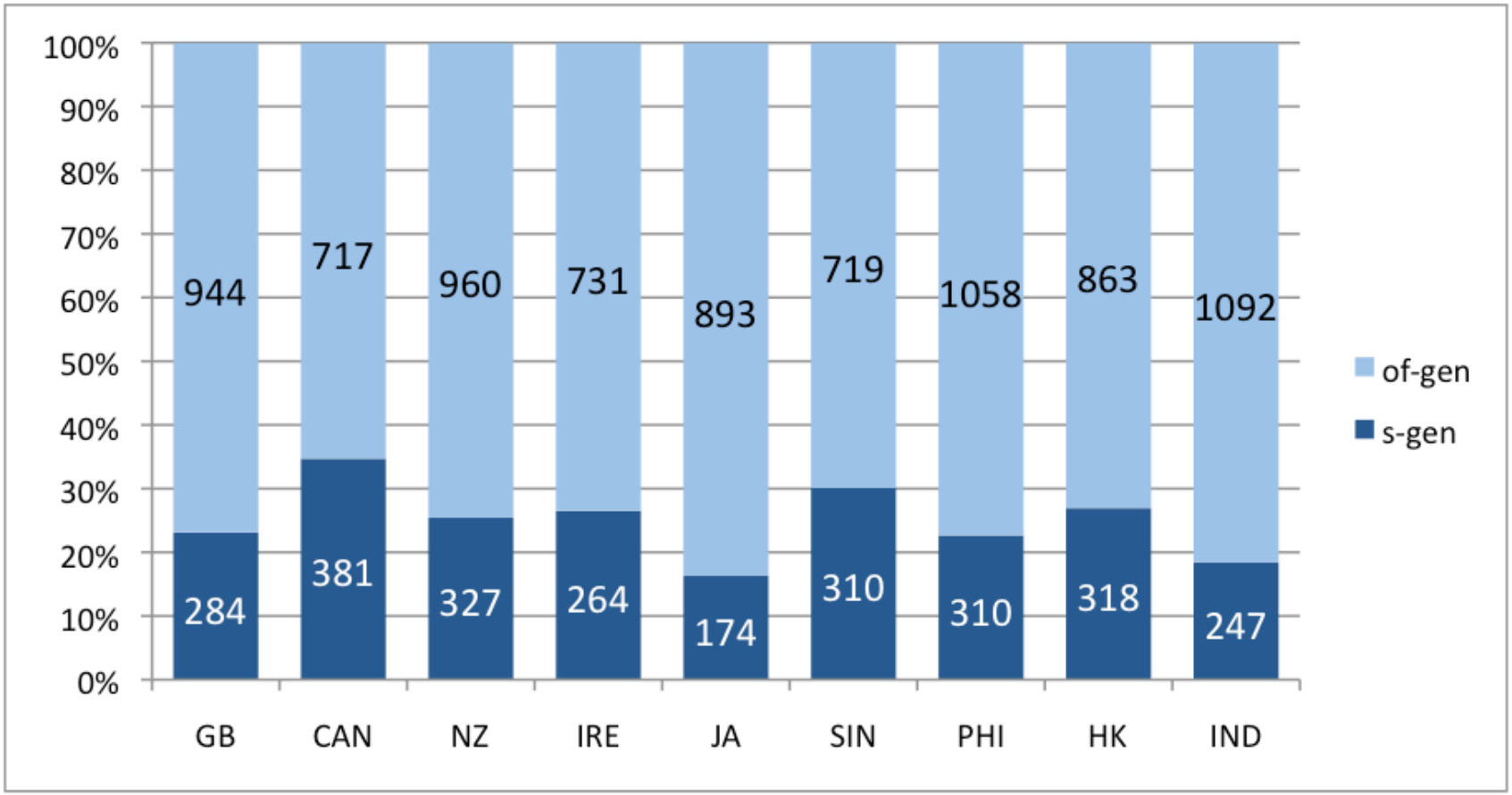
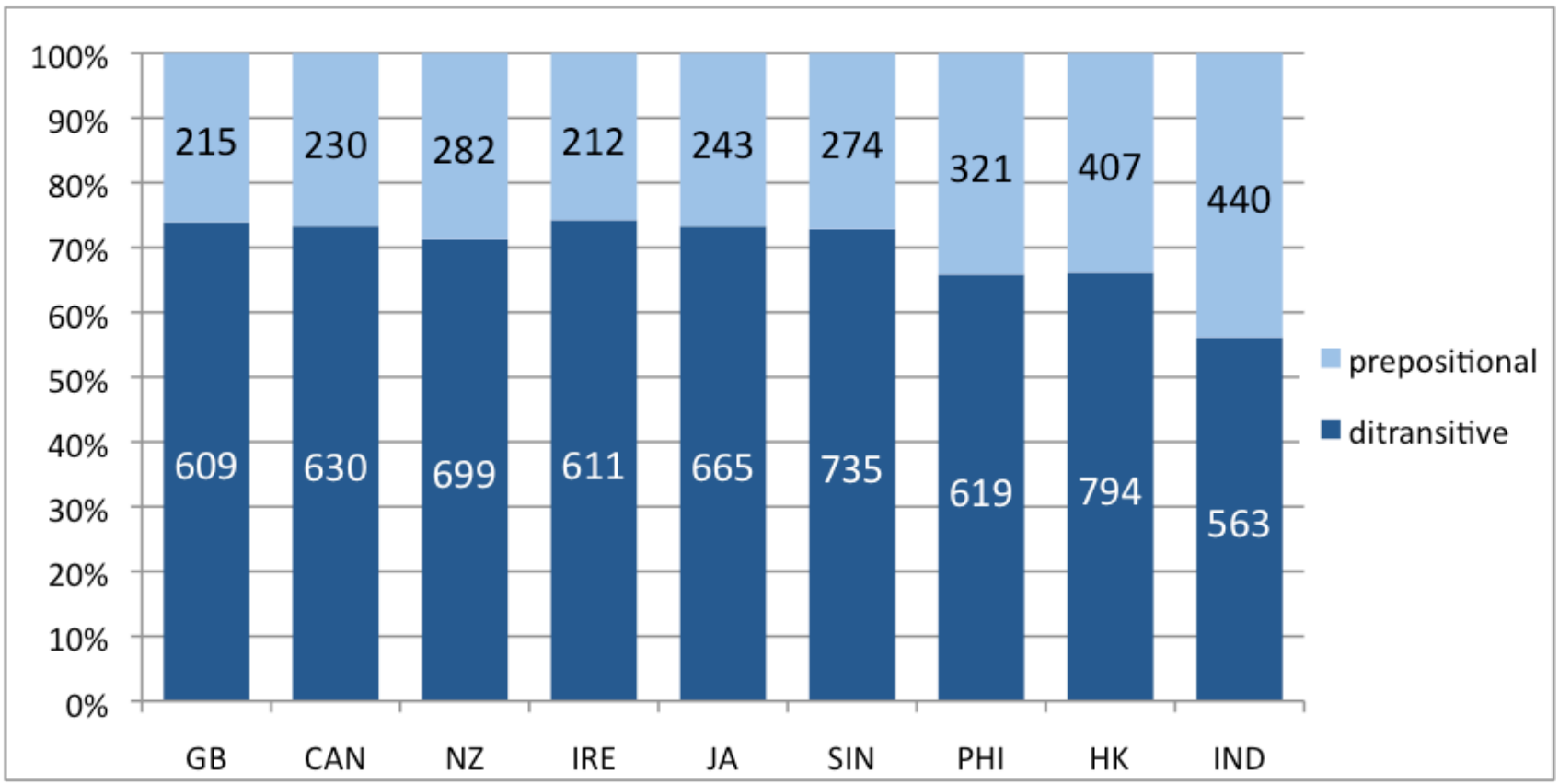
Proportion of genitives according to variety

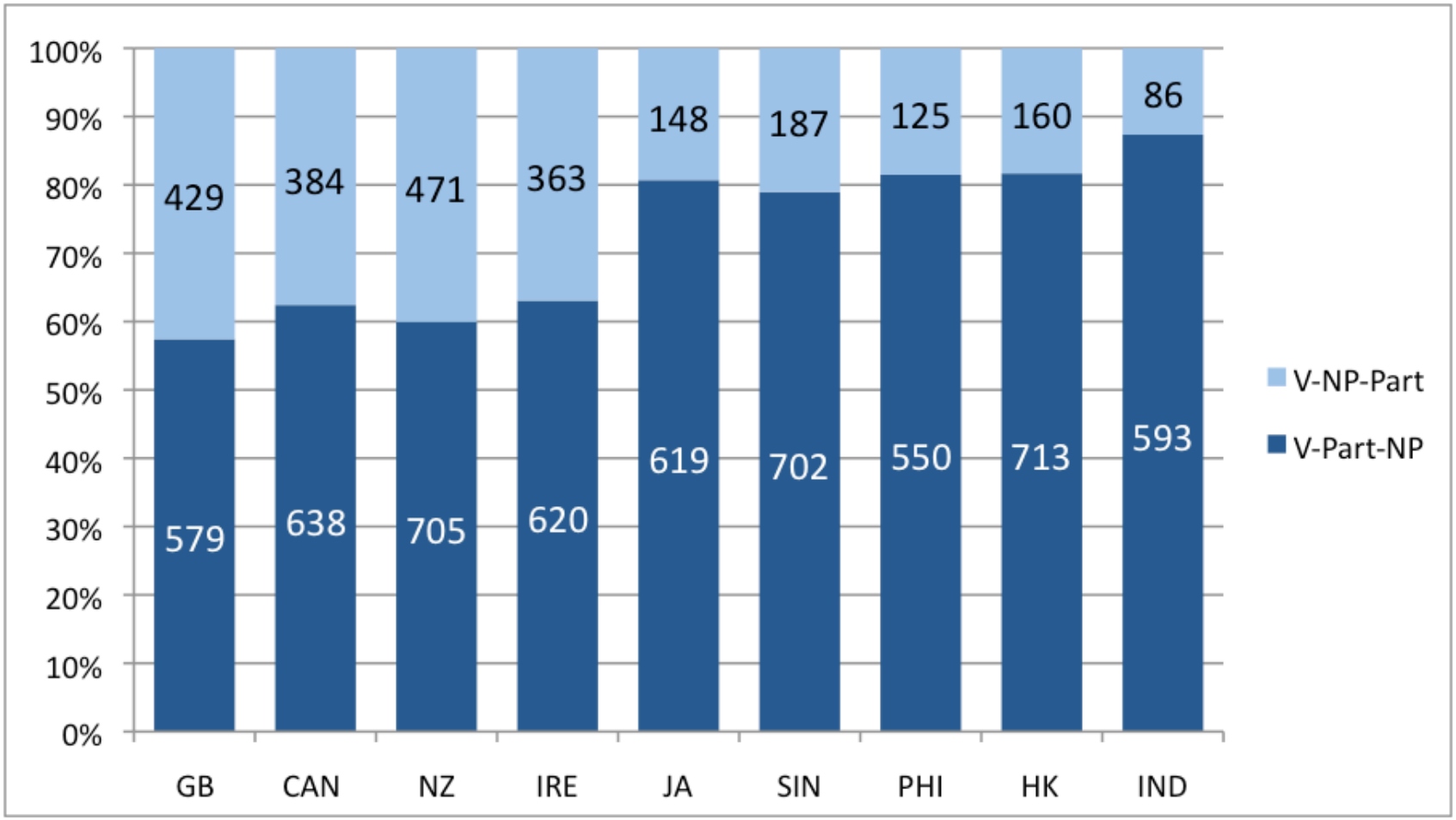


Proportion of datives according to variety



N=8,549

Proportion of particle verbs according to variety



N=8,072